

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Re-Issue Patent Application of:  
Loveday *et al.*

Confirmation No.: 4294

Application No: 10/761,101

Docket No.: 1999U026.RE.US

Filed: January 20, 2004

Art Unit: 1796

Title: *Catalyst Composition, Method of  
Polymerization and Polymer Therefrom*

Examiner: William K. Cheung

Date: August 28, 2009

Customer No.: 25959

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

Sir:

Pursuant to 37 C.F.R. § 41.37, please consider the following Appellant's Brief in the referenced Application currently before the Board of Patent Appeals and Interferences. This brief is filed within one month of the Notice of Panel Decision from Pre-Appeal Brief Review mailed on July 30, 2009, and is in furtherance of the Notice of Appeal filed on June 8, 2009.

## TABLE OF CONTENTS

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

I.	REAL PARTY IN INTEREST .....	4
II.	RELATED APPEALS AND INTERFERENCES.....	4
III.	STATUS OF THE CLAIMS .....	4
IV.	STATUS OF AMENDMENTS .....	4
V.	SUMMARY OF CLAIMED SUBJECT MATTER .....	5
VI.	GROUND OF REJECTION TO BE REVIEWED ON APPEAL .....	7
VII.	ARGUMENT .....	8
A.	The rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 on the ground of nonstatutory obviousness-type double patenting.....	8
B.	Claims 1, 7-10, 17, and 19-21 are patentable over U.S. Patent No. 6,271,325 to McConville in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	8
C.	Claims 12 and 15 are patentable over U.S. Patent No. 6,271,325 to McConville in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	16
D.	Claim 49 is patentable over U.S. Patent No. 6,271,325 to McConville in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	18
E.	Claims 1, 7-10, 17, and 19-21 are patentable over U.S. Patent No. 6,294,495 to Matsunaga in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	18
F.	Claims 12 and 15 are patentable over U.S. Patent No. 6,294,495 to Matsunaga in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	20
G.	Claim 49 is patentable over U.S. Patent No. 6,294,495 to Matsunaga in view of U.S. Patent No. 4,530,914 to Ewen <i>et al.</i> under 35 USC 103(a).....	22
H.	Conclusion .....	22
VIII.	CLAIMS APPENDIX.....	25
IX.	EVIDENCE APPENDIX.....	30
X.	RELATED PROCEEDINGS APPENDIX .....	31

**TABLE OF AUTHORITIES**

**Cases**

<i>Corona Cord Tire Co. v. Dovan Chemical Corp.</i> , 276 U.S. 358 (1928).....	12
<i>Bristol-Myers Co. v. U.S. ITC</i> (CAFC 1989) [15 PQ2d 12581].....	11
<i>Ex parte Berger</i> , 108 USPQ 236 (POBA 1952) .....	13
<i>Ex parte Levengood</i> , 28 U.S.P.Q. 1300 (BPAI 1993) .....	8
<i>Frifsch v. Lin</i> , 21 PQ2d 1739 (BPAI 1991).....	11
<i>Graham v. John Deere Co.</i> , 383 U.S. 1; 148 USPQ 459 (1966) .....	14
<i>In re Cofer</i> , 354 F.2d 664; 148 USPQ 268 (CCPA 1966).....	11
<i>In re Doumcai</i> , 281 F.2d 215; 126 USPQ 408 (CCPA 1960).....	12
<i>In re Fine</i> , 837 F.2d 1071; 5 USPQ2d 1596 (Fed. Cir. 1988) .....	8
<i>In re Laskowski</i> , 871 F.2d 115; 10 USPQ2d 1397 (Fed. Circ. 1989).....	23
<i>In re Reynolds</i> , 443 F.2d 384; 170 USPQ 94 (CCPA 1971).....	15
<i>In re Robertson</i> , 169 F.3d 743; 49 USPQ2d 1949 (Fed. Cir. 1999).....	15
<i>In re Skoll</i> , 523 F.2d 1392; 187 USPQ 481 (CCPA 1975).....	8
<i>In re Smythe</i> , 480 F.2d 1376; 178 USPQ 279 (CCPA 1973).....	15
<i>In re Stencel</i> , 828 F.2d 751; 4 USPQ2d 1071 (Fed. Cir. 1987).....	23
<i>In re West</i> , 160 F.2d 570; 73 USPQ 227 (CCPA 1947) .....	13
<i>In re Wilson</i> , 424 F.2d 1382; 165 USPQ 494 (CCPA 1970).....	8
<i>KSR International Co. v. Teleflex Inc.</i> , 550 U.S. 398; 83 USPQ2d 1385 (2007).....	12
<i>Stratoflex Inc. v. Aeroquip Corp.</i> , 713 F.2d 1530; 218 USPQ 871 (Fed. Cir. 1983).....	14
<i>Uniroyal, Inc. v. Rudkin-Wiley Corp.</i> , 837 F.2d 1044; 5 USPQ2d 1434 (Fed. Cir. 1988)....	14

**Rules**

MPEP § 1454.....	25
MPEP § 2163.07 .....	15

**I. REAL PARTY IN INTEREST**

The real party in interest in this appeal is Univation Technologies, LLC, the assignee of the present application.

**II. RELATED APPEALS AND INTERFERENCES**

To the best of Appellants' knowledge, there are no other appeals or interferences, or other judicial proceedings that exist at this time which may be related to, or will directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

**III. STATUS OF THE CLAIMS**

Claims 1, 7-10, 12, 15, 17, 19-21, and 49 are pending in the application. Claims 2-6, 11, 13-14, 16, 18, and 22-48 have been cancelled. New Claim 49 has been added relative to U.S. Patent No 6,274,684.

All of the pending claims stand rejected on the ground of nonstatutory obviousness-type double patenting. All of the pending claims stand rejected under 35 U.S.C. §103(a).

The rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 are appealed.

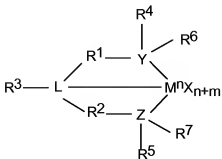
**IV. STATUS OF AMENDMENTS**

Per the Notice of Panel Decision mailed July 30, 2009 in response to Appellants request for a Pre-Appeal Brief Review, Appellants' Pre-Appeal Brief Request for Review has not overcome the rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 under 35 USC §103(a). A copy of the claims as they currently stand amended as relative to U.S. Patent No. 6,274,684 is appended hereto in the Claims Appendix.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

The instant application is a reissue application based on U.S. Patent No. 6,274,684 to Loveday *et al.* (hereinafter "Loveday"). The claimed invention relates to a polymerization process for making polyolefins comprising combining olefins, a first catalyst component comprising a Group 15 containing tridentate catalyst compound, and a second metallocene catalyst component to form a polyolefin. The polymers produced according to the instant invention include bimodal polyolefins which are produced in a single reactor having improved rheological properties relating to pipe extrusion, films, and various articles of manufacture.

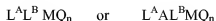
Independent Claim 1 as currently amended claims a process for polymerizing olefin(s). The process comprises combining olefin(s) and a catalyst composition having a first catalyst component and a second catalyst component. The first catalyst component comprises a Group 15 containing tridentate ligated Group 3 to 7 metal compound wherein the Group 3 to 7 metal atom is bound to at least one leaving group and to three Group 15 atoms, and wherein two of the Group 15 atoms are each bound to the third Group 15 atom through a bridging group. The second catalyst component is a metallocene compound. The first catalyst component and the second catalyst component are added to a polymerization reactor in one of a solution, a suspension or an emulsion. The polymerization process is a continuous gas or slurry phase process. The Group 15 containing tridentate ligated hafnium catalyst compound is represented by the formula:



Formula (I)

wherein M is a Group 3 to 7 metal; each X is independently a leaving group; n is the oxidation state of M; m is the formal charge of the Y, Z and L ligand; L is a Group 15 element; Y is a Group 15 element; Z is a Group 15 element; R<sup>1</sup> and R<sup>2</sup> are independently a linear, branched, or cyclic C<sub>2</sub> to C<sub>20</sub> alkylene group; R<sup>3</sup> is a hydrocarbon group, hydrogen, a halogen, or a heteroatom containing group; R<sup>4</sup> and R<sup>5</sup> are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or multiple ring system; R<sup>1</sup> and R<sup>2</sup> may be interconnected to each other, and/or R<sup>4</sup> and R<sup>5</sup> may be interconnected to each other; and R<sup>6</sup> and R<sup>7</sup> are independently absent, or hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group. Support for Claim 1 may be found at least in Loveday Claims 1, 2, 4, and 6, and at Col. 3, line 1 to Col. 4, line 37 of Loveday.

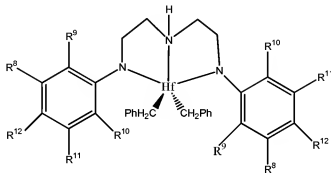
Claim 12 depends from Claim 1. Claim 12 as currently amended claims the process of claim 1 wherein the second catalyst component comprises a metallocene compound of the general formula:



wherein M is a Group 4, 5 or 6 metal atom; L<sup>A</sup> and L<sup>B</sup> are selected from the group consisting of cyclopentadienyl, tetrahydroindenyl, indenyl, fluorenyl, and substituted versions thereof, L<sup>A</sup> and L<sup>B</sup> are each bonded to M; Q is a monoanionic leaving group; A is a divalent bridging group containing at least one Group 13 to Group 16 atom; and n is 0, 1 or 2. Support from Claim 12 may be found in Claim 12 of Loveday, and also at Col. 6, line 13 to Col. To Col. 8, line 51 of Loveday under the heading "Bulky Ligand Metallocene-Type Compound."

Claim 15 depends from Claim 12. Claim 15 as currently amended claims the process of claim 12 wherein M is a Group 4 metal. Support from Claim 15 may be found in Loveday Col. 6, Lines 42-45 and 55.

Claim 49 depends from Claim 1. Claim 49 claims the process of Claim 1, wherein the Group 15 containing tridentate ligated Group 3 to 7 metal compound is represented by the formula:



wherein R<sup>8</sup> to R<sup>12</sup> are each independently a methyl, ethyl, propyl, or butyl group. Support for Claim 49 may be found at Col. 4, line 38 to Col. 5, line 41 of Loveday.

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 on the ground of nonstatutory obviousness-type double patenting.

The rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,271,325 to McConville in view of U.S. Patent No. 4,530,914 to Ewen et al.

The rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,294,495 to Matsunaga in view of U.S. Patent No. 4,530,914 to Ewen et al. under 35 USC 103(a).

## VII. ARGUMENT

### A. THE REJECTION OF CLAIMS 1, 7-10, 12, 15, 17, 19-21, AND 49 ON THE GROUND OF NONSTATUTORY OBVIOUSNESS TYPE DOUBLE PATENTING.

Regarding the rejection of the instant claims under nonstatutory obviousness-type double patenting, once the bounds of the instant invention are determined, a Terminal Disclaimer will be filed over U.S. Patent No. 6,271,325 to McConville as appropriate.

### B. CLAIMS 1, 7-10, 17, AND 19-21 ARE PATENTABLE OVER U.S. PATENT NO. 6,271,325 TO MCCONVILLE IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL. UNDER 35 USC 103(a).

The Final Office Action dated April 6, 2009 (the "Final Action"), maintains that Appellants' presently claimed invention is rendered obvious over U.S. Patent No. 6,271,325 to McConville (hereinafter "McConville") in view of U.S. Patent No. 4,530,914 to Ewen et al. (hereinafter "Ewen"). Appellants respectfully disagree.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 837 F.2d 1071; 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In re Wilson*, 424 F.2d 1382; 165 USPQ 494, 496 (C.C.P.A. 1970).

Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levengood*, 28 USPQ 1300 (BPAI 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In re Skoll*, 523 F.2d 1392; 187 U.S.P.Q. 481 (CCPA 1975).



It is Appellants' position that the Final Action has failed to establish a *prima facie* case of obviousness. While the recited Group 15 containing tridentate catalyst is known and the recited metallocene catalyst is known, the cited prior art fails to disclose or suggest combining these two types of catalysts in a single reactor to produce a polyolefin. Furthermore, the cited prior art fails to provide any motivation or likelihood of success in doing so.

Appellants recite, *inter-alia*, "a process for polymerizing olefin(s) comprising, combining said olefin(s), a catalyst composition having a first catalyst component comprising a Group 15 containing tridentate ligated Group 3 to 7 metal compound wherein the Group 3 to 7 metal atom is bound to at least one leaving group and to three Group 15 atoms, and wherein two of the Group 15 atoms are each bound to the third Group 15 atom through a bridging group (hereinafter referred to as the "Group 15 Catalyst"); and a second catalyst component which is a metallocene compound;...wherein the polymerization process is a continuous gas or slurry phase process..."

According to the Final Action, "[t]he difference between the invention of claims 1, 7-10, 12, 15, 17, 19-21, 49 and McConville et al. is that McConville do[es] not teach a process involving a second metallocene catalyst." Final Action, Page 6. The Final Action maintains however, that "Ewen et al. (col. 2, line 24 to col. 3, line 2; col. 10, claim 3) clearly teach[es] a polymerization process involving using at least two or more metallocene catalyst[s]. Motivated by the expectation of success of developing a polymerization process that can be used to produce a broad and multimodal molecular weight distribution (col. 1, line 5-10), it would have been obvious to one of ordinary skill in art to incorporate the second metallocene catalyst teaching of Ewen et al. into the invention of McConville to obtain the invention as claimed." *Id.*

As discussed on Page 13 of the Response dated February 23, 2009, Appellants concede that McConville discloses a catalyst having the same general formula as the Group 15 catalyst recited in the presently claimed invention. However, Appellants maintain that McConville fails to disclose or suggest combining the recited Group 15 catalyst with a metallocene catalyst

compound. As discussed above, the Final Action concedes this same point i.e., wherein the Final Action states that the difference between the invention of claims 1, 7-10, 12, 15, 17, 19-21, 49 and McConville is that McConville do[es] not teach a process involving a second metallocene catalyst.

To cure the defects in McConville, the Final Action relies on the teachings of Ewen, i.e., wherein the Final Action states that motivated by the expectation of success of developing a polymerization process that can be used to produce a broad and multimodal molecular weight distribution, it would have been obvious to one of ordinary skill in the art to incorporate the second metallocene catalyst teaching of Ewen into the invention of claims 1-38 of McConville to obtain Appellants' claimed invention.

Ewen is generally directed to polyolefins having a broad molecular weight distribution obtained by polymerizing ethylene or higher alpha olefins in the presence of a catalyst system comprising two or more metallocenes and alumoxane, wherein each of the metallocenes has a different propagation and termination rate constant. At Col. 2, line 44 to Col. 3, line 21, Ewen discloses:

“[a]ccordingly, there is provided catalyst systems and especially systems for the polymerization of ethylene to polyethylene having a broad molecular weight distribution and especially a bimodal or multimodal molecular weight distribution; said catalyst system comprising (a) at least two different metallocenes each having different propagation and termination rate constants for ethylene polymerizations and (b) an alumoxane. The metallocenes employed in accordance with this invention are organometallic coordination compounds which are cyclopentadienyl derivatives of a transition metal of Group 4b, 5b and 6b metals of the Periodic Table and include mono, di and tricyclopentadienyls and their derivatives of the transition metals. The metallocenes can be represented by the general formula  $(C_5 R'_m)_p R''_s (C_5 R'_m)MeQ_{3-p}$  or  $R''_s (C_5 R'_m)_2 MeQ'$ ,...

It is highly surprising that two different metallocenes in combination with an alumoxane can produce polyethylene having a broad MWD since the

individual metallocenes with an alumoxane generally obtains polyethylene having a narrow MWD. In accordance with this invention, however, one can advantageously tailor polyethylene having desired molecular weights and molecular weight distributions by the judicious selection of metallocenes.”

(emphasis added).

Ewen thus discloses a process wherein two catalysts of the same class of compounds (i.e., two metallocene catalysts) are combined to produce a polyolefin. In Ewen, the two similar catalysts are combined under conditions in which each of the individual catalysts is capable of producing a polyolefin (see Comparative Examples 1A and 1B Col. 7, lines 35-54.) Ewen fails to disclose or suggest combining a metallocene catalyst with another type of catalyst, much less Appellants' recited Group 15 catalyst compound. In addition, Ewen fails to disclose or suggest Appellants' recited continuous process. McConville or McConville in combination with Ewen thus fail to disclose or suggest all the limitations recited by Appellants' in the currently claimed invention. As such, the Final Action fails to establish a prima facie case of obviousness.

A finding of obviousness requires “a suggestion or teaching that the claimed novel form of the prior art compound could or should be prepared.” *In re Cofer*, 354 F.2d 664; 148 USPQ 268 (CCPA 1966), cited with approval in the unpublished decision of the CAFC in *Bristol-Myers Co. v. U.S. ITC* (CAFC 1989) [15 PQ2d 12581]. In addition, a finding of obviousness requires a “reasonable expectation of success.” *Frifsch v. Lin*, 21 PQ2d 1739 (BPAI 1991). Nothing in Ewen suggests replacing one of the two metallocene catalysts with a completely different type of catalyst having a completely different chemistry in the same reactor. Any motivation or likelihood of success found in Ewen would be directed to selecting different metallocene catalysts (e.g., metallocene catalysts having different propagation and termination rate constants). Ewen fails to provide any motivation or likelihood of success with regard to using a different type of a catalyst. Accordingly, the combination of McConville with Ewen fails the so-called, “teaching, suggestion, motivation” (hereinafter “TSM”) test for determining obviousness under 35 U.S.C. §103.

In a more recent decision by the Supreme Court, the Supreme Court has warned against a rigid adherence the above described TSM test. According to the Supreme Court, "when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely *the* product not of innovation, but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103." *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398; 83 USPQ2d 1385 (2007).

However, replacing one of two metallocene catalysts required by Ewen with a totally different type of catalyst having a totally different type of chemistry and mode of action to achieve an as yet unknown result cannot reasonably be considered to be what the court refers to as a results effective variable found within the "common sense" of one skilled in the art of olefin polymerization catalysts. This is especially true when one considers the unpredictable nature of catalysis.

It has long been established that catalysis is generally considered unpredictable merely from the chemical nature of the catalyst. *Corona Cord Tire Co. v. Dovan Chemical Corp.* 276 US 358, 369 (1928). Catalytic effects are not ordinarily predictable with certainty. *In re Doumcai*, 281 F.2d 215; 126 USPQ 408 (CCPA 1960). The reasoning of the Final Action is in contrast to this well established facet of law, and with Ewen itself. Indeed, Ewen discloses that the combination of two similar catalysts produces a "surprising result" in view of what each of the catalysts produce in the absence of one-another.

However, according to the Final Action, since it is know to combine two catalyst of the same type under conditions wherein each of the two catalysts are operable, is must then be obvious to combine two different types of catalysts in the same reactor. Furthermore, According to the Final Action, since two similar catalysts could be combined in the same reactor to produce a particular product, it is obvious that two dissimilar catalysts may be combined in the same

reactor to produce that same type of product. While it is well established that the known similarity between two materials may suggest the probability of the suitability of one material for a particular purpose when the other is known to be useful for that purpose (*In re West*, 160 F.2d 570; 73 USPQ 227 (CCPA 1947)), the Final Action's reasoning contradicts the well established rule of law that the effect of a modification of one prior art catalytic process in a manner employed in another prior art process which employs a different catalyst was held unpredictable. See *Ex parte Berger et al.*, 108 USPQ 236 (POBA 1952). Accordingly, the Final Action fails to establish a prima facie case of obviousness.

In view of Appellants' disclosure, it is now known that the recited Group 15 catalyst of McConville may in fact be combined with a metallocene catalyst in the same reactor to produce a polymer having a broad and/or a bimodal molecular weight distribution. However, prior to Appellants' disclosure, the art failed to provide any indication or suggestion as to the types of interactions which may occur as a result of combining these two catalysts in the same reactor, and/or if the chemistry of these two different types of catalysts would be active in concert to produce a polyolefin, and/or what type of polyolefin would be produced by this combination of catalysts assuming that the catalyst remained active in the presence of one another, and/or the likelihood of success in doing so.

In the absence of any disclosure in the cited prior art, any finding of a suggestion to combine two references based on a possible mode of operation hypothesized by Appellants subsequent to that finding of an improvement in the art cannot be based on science or skill in the art. Instead, such a suggestion to combine must be based on impermissible hindsight, which is an improper conclusion that an invention is unpatentable as being obvious, obtained by reading back into the prior art the teachings of the invention which came later. A rejection based on hindsight does not rise to the level of obviousness under §103.

An invention is unpatentable if the differences between the invention and the prior art are such that "the subject matter as a whole would have been obvious at the time the invention was

made” to a person skilled in the art. Thus, the proper time frame to apply the obviousness test is that moment just before the invention was made, not whether the invention appears obvious to a judge or jury after they learn all about the invention. *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538; 218 USPQ 871, 879 (Fed. Cir. 1983). The U.S. Supreme Court has also cautioned against “slipping into the use of hindsight” and urged courts “to resist the temptation to read into the prior the teachings of the invention in issue.” *Graham v. John Deere Co.*, 383 U.S. 1, 36; 148 USPQ 459,474 (1966). “[I]mpermissible “hindsight” is using knowledge of the solution to determine that the answer to the technical problem was “obvious,” whereas to one without knowledge of the solution, the answer was not “obvious” at all.” “[T]here must be something in the prior art that suggested the combination of these particular prior art devices and processes other than the hindsight gained from knowing that the inventor chose to combine these particular things in this particular way.” *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051; 5 USPQ2d 1434, 1438 (Fed. Cir. 1988).

By the Final Action's admission, McConville fails to suggest or disclose the combination of the Group 15 catalyst with a metallocene. Also by the Final Action's admission, Ewen fails to suggest or disclose a combination of catalysts other than two metallocene catalysts, which Ewen admits to producing a “surprising result.” Accordingly, in the absence of hindsight, the cited prior art fails to disclose or suggest Appellants' recited process.

In addition to the basis of the rejection of the claims discussed above, the Final Action further states:

“[r]egarding applicants' argument that Ewen et al. do not teach a mixture of catalyst system comprising a non-metallocene type catalyst, applicants fail to recognize that the argument is not supported by the claims as written since the claims do not restrict a catalyst system comprising a non-metallocene catalyst. In view of the reasons set forth above, the instant rejection is maintained”

(Final Action, Page 8).

Appellants respectfully disagree with this statement. Claim 1 explicitly limits the presently claimed invention to comprise the recited Group 15 containing tridentate ligated Group 3 to 7 metal compound and a metallocene compound. Thus, the presently claimed invention does so “restrict” the presently claimed invention to “a catalyst system comprising a non-metallocene catalyst.”

In addition, Appellants further resist the rejection of the claims as obvious since the cited prior art fails to disclose or suggest a continuous process. In response, the Final Action states:

“[r]egarding applicants’ argument on the claimed “continuous” feature, McConville et al. (abstract; col. 14, claim 1) disclose[es] an olefin polymerization process in the gas phase or slurry phase comprising a catalyst in the presence of an activator that is substantially identical to the catalyst system as claimed, that are inherently continuous”

(Final Action, Page 7, emphasis added).

Appellants respectfully disagree with this characterization of the prior art. According to MPEP § 2163.07(a) entitled Inherent Function, Theory, or Advantage

“[b]y disclosing in a patent application a device that inherently performs a function or has a property, operates according to a theory or has an advantage, a patent application necessarily discloses that function, theory or advantage, even though it says nothing explicit concerning it. The application may later be amended to recite the function, theory or advantage without introducing prohibited new matter. *In re Reynolds*, 443 F.2d 384, 170 USPQ 94 (CCPA 1971); *In re Smythe*, 480 F. 2d 1376; 178 USPQ 279 (CCPA 1973). “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” *In re Robertson*, 169 F.3d 743, 745; 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).”

(MPEP § 2163.07(a), emphasis added).

As is known to one of ordinary skill in the art, all olefin polymerization processes are not, and need not be continuous. While being continuous is a "possibility" for some olefin polymerization processes depending on the mode of polymerization and the catalyst used, this limitation is not necessarily available and/or required in such processes. Accordingly, for the Final Action to find that the process of McConville is inherently continuous in the absence of any disclosure in the reference to that effect, the Final Action must too find that all such olefin polymerization processes are necessarily continuous; which is simply a false conclusion. Accordingly, the finding of the Final Action that the polymerization process of McConville is inherently continuous contradicts the well established rule of law which defines an inherent property to be necessarily present in the thing described.

Thus, Appellants submit that there is no suggestion nor motivation in the cited prior art to combine the recited Group 15 catalyst with a metallocene catalyst in the same reactor;

the claims do limit the claimed invention to include a non-metallocene catalyst; and

the cited prior art fails to disclose or suggest a continuous process using the instant catalysts.

As such, the Final Action fails to establish a prima facie case of obviousness and as such, McConville in view of Ewen fails to render the presently claimed invention obvious.

**C. CLAIMS 12 AND 15 ARE PATENTABLE OVER U.S. PATENT NO. 6,271,325 TO MCCONVILLE IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL. UNDER 35 USC 103(a).**

Claim 12 depends from Claim 1; and Claim 15 depends from Claim 12. Appellants wish to explicitly confirm that the arguments provided in Section VII(B) of the instant appeal are incorporated into the following arguments regarding Claims 12 and 15. Recitations of the arguments presented in Section VII(B) of the instant appeal are not reproduced in the instant section for the sake of brevity.



Claims 12 and 15 further limit the presently claimed invention to include a particular type of metallocene catalyst. In particular, the metallocene catalyst is a “bulky ligand” metallocene catalyst as defined in Loveday.

McConville fails to disclose or suggest a metallocene catalyst or a bulky ligand metallocene catalyst. Ewen discloses metallocene catalysts, but fails to disclose or suggest the bulky ligand metallocene catalysts recited by the presently claimed invention. Appellants define “bulky ligand” metallocene catalysts to include “one or more open, acyclic or fused ring(s) or ring system(s) or a combination thereof.” See Loveday Col. 6, lines 28-30. Appellants further disclose through the various examples that use of the claimed bulky ligand metallocene catalyst results in an unexpected and non-obvious improvements in the properties of the polymer produced using the presently claimed invention (i.e., as in Claim 12 where the second catalyst component comprises a metallocene compound of the general formula  $L^A L^B MQ_n$  or  $L^A AL^B MQ_n$ , wherein M is a Group 4, 5 or 6 metal atom,  $L^A$  and  $L^B$  are selected from the group consisting of cyclopentadienyl, tetrahydroindenyl, indenyl, fluorenyl, and substituted versions thereof,  $L^A$  and  $L^B$  are each bonded to M; each Q is a monoanionic leaving group, A is a divalent bridging group containing at least one Group 13 to Group 16 atom; and n is 0, 1 or 2; and/or as in Claim 15 where M is a Group 4 metal). Neither Ewen, McConville, nor a combination of the references provides any suggestion or motivation to select this particular type of metallocene catalyst.

Since Ewen fails to disclose or suggest the recited metallocene catalyst of the presently claimed invention, Ewen cannot be found to combine with McConville to render the presently claimed invention obvious.

**D. CLAIM 49 IS PATENTABLE OVER U.S. PATENT NO. 6,271,325 TO MCCONVILLE IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL. UNDER 35 USC 103(a).**

Claim 49 depends from Claim 1. Appellants wish to explicitly confirm that the arguments provided in Section VII(B) of the instant appeal are incorporated into the following arguments regarding Claim 49. Recitations of the arguments presented in Section VII(B) of the instant appeal are not reproduced in the instant section for the sake of brevity.

Claim 49 further limits the presently claimed invention to a particular subset of the recited Group 15 catalyst compound, which is exemplified in Loveday. As Appellants show in the Examples of the instant disclosure, a Group 15 catalyst compound limited according to the limitations recited in Claim 49, when utilized according to the presently claimed invention, produces a polymer having unexpected and non-obvious improvements over polymers produced by processes known in the art. While McConville discloses this Group 15 catalyst compound to be a preferred embodiment, nothing in McConville nor Ewen discloses or suggests that this particular embodiment of the Group 15 catalyst compound will combine with a metallocene catalyst compound to produce a polymer having the novel and non-obvious benefits as disclosed in the instant application.

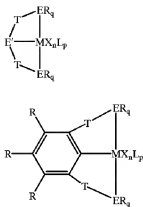
McConville and/or Ewen fail to disclose or suggest combination of the recited Group 15 catalyst compound with a metallocene catalyst of the presently claimed invention. As such, Ewen cannot be found to combine with McConville to render the presently claimed invention obvious.

**E. CLAIMS 1, 7-10, 17, AND 19-21 ARE PATENTABLE OVER U.S. PATENT NO. 6,294,495 TO MATSUNAGA IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL. UNDER 35 USC 103(a).**

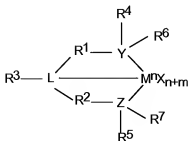
The Final Action maintains that Appellants' presently claimed invention is rendered obvious over U.S. Patent No. 6,294,495 to Matsunaga (hereinafter "Matsunaga") in view of Ewen.

Similar to McConville, Matsunaga is generally directed to an activated transition metal catalyst in a reduced oxidation state for olefin polymerization. Matsunaga fails to disclose or suggest Appellants' recited process comprising a Group 15 containing catalyst compound; much less Appellants' recited catalyst in combination with a metallocene catalyst. Matsunaga further fails to disclose or suggest Appellants' recited continuous process.

Furthermore, Appellants have amended the instant claims to further clarify the differences between the presently claimed invention and the Matsunaga disclosure. In particular, Matsunaga discloses an activated tridentate, monoanionic ligand based transition metal catalyst having the following formula:



In contrast, Appellants limit the recited Group 15 catalyst to having the following structure:



wherein R<sup>1</sup> and R<sup>2</sup> are independently a linear, branched, or cyclic C<sub>2</sub> to C<sub>20</sub> alkylene group.

Matsunaga fails to disclose a structure wherein Appellants' recited R<sup>1</sup> and R<sup>2</sup> are independently a linear, branched, or cyclic C<sub>2</sub> to C<sub>20</sub> alkylene group. Instead, Matsunaga

discloses structures wherein  $R^1$  and  $R^2$  are aromatic moieties, which based on the bond distances, brings into doubt whether or not Matsunaga actually discloses a truly tridentate ligand. Matsunaga fails to disclose or suggest Appellants' recited first catalyst component comprising a Group 15 containing tridentate ligated Group 3 to 7 metal compound wherein the Group 3 to 7 metal atom is bound to at least one leaving group and to three Group 15 atoms, and wherein two of the Group 15 atoms are each bound to the third Group 15 atom through a linear, branched, or cyclic  $C_2$  to  $C_{20}$  alkylene bridging group. Even if support for Appellants' recited Group 15 catalyst could be found in Matsunaga, the reference fails to disclose or suggest combining the catalyst with a metallocene catalyst according to Appellants' presently claimed invention. As discussed above in relation to McConville, Ewen too fails to cure the defects in Matsunaga.

In the absence of any suggestion or motivation to modify the catalyst in Matsunaga to comport with Appellants' presently claimed invention, and/or to combine a metallocene catalyst in a continuous process with the catalyst modified to comport with Appellants' presently claimed invention, Matsunaga in view of Ewen cannot reasonably be found to render the instant claims obvious.

**F. CLAIMS 12 AND 15 ARE PATENTABLE OVER U.S. PATENT NO. 6,294,495 TO MATSUNAGA IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL. UNDER 35 USC 103(a).**

Claim 12 depends from Claim 1; and Claim 15 depends from Claim 12. Appellants wish to explicitly confirm that the arguments provided in Sections VII(B) and VII(E) of the instant appeal are incorporated into the following arguments regarding Claims 12 and 15. Recitations of the arguments presented in Sections VII(B) and VII(E) of the instant appeal are not reproduced in the instant section for the sake of brevity.

Claims 12 and 15 further limit the presently claimed invention to include a particular type of metallocene catalyst. In particular, the metallocene catalyst is a “bulky ligand” metallocene catalyst as defined in the instant specification.

Matsunaga fails to disclose or suggest Appellants' recited Group 15 catalyst and/or a bulky ligand metallocene catalyst. Ewen discloses metallocene catalyst, but fails to disclose or suggest the bulky ligand metallocene catalysts recited in Claims 12 and 15. Appellants define “bulky ligand” metallocene catalysts to include “one or more open, acyclic or fused ring(s) or ring system(s) or a combination thereof.” See Loveday Col. 6, lines 28-30. In the various examples, Appellants disclose the unexpected and non-obvious improvements in the properties of the polymer produced using the presently claimed invention wherein the metallocene catalyst is selected to be a bulky ligand metallocene (i.e., as in Claim 12 where the second catalyst component comprises a metallocene compound of the general formula  $L^A L^B M Q_n$  or  $L^A A L^B M Q_n$ , wherein M is a Group 4, 5 or 6 metal atom,  $L^A$  and  $L^B$  are selected from the group consisting of cyclopentadienyl, tetrahydroindenyl, indenyl, fluorenyl, and substituted versions thereof,  $L^A$  and  $L^B$  are each bonded to M; each Q is a monoanionic leaving group, A is a divalent bridging group containing at least one Group 13 to Group 16 atom, and n is 0, 1 or 2; and/or as in Claim 15 where M is a Group 4 metal). Neither Matsunaga nor Ewen disclose a bulky ligand metallocene catalyst, much less provide any motivation or suggestion to combine such a catalyst with the recited Group 15 catalyst compound.

As Matsunaga and Ewen, alone or in combination with one another, fail to disclose or suggest the recited combination of the recited Group 15 catalyst compound with the bulky ligand metallocene catalyst of the presently claimed invention, Ewen cannot be found to combine with Matsunaga to render the presently claimed invention obvious.

**G. CLAIM 49 IS PATENTABLE OVER U.S. PATENT NO. 6,294,495 TO MATSUNAGA IN VIEW OF U.S. PATENT NO. 4,530,914 TO EWEN ET AL UNDER 35 USC 103(a).**

Claim 49 depends from Claim 1. Appellants wish to explicitly confirm that the arguments provided in Sections VII(B) and VII(E) of the instant appeal are incorporated into the following arguments regarding Claim 49. Recitations of the arguments presented in Sections VII(B) and VII(E) of the instant appeal are not reproduced in the instant section for the sake of brevity.

Claim 49 further limits the presently claimed invention to a particular subset of the recited Group 15 catalyst compound, which is exemplified in Loveday. As Appellants show in the Examples of the instant disclosure, a Group 15 catalyst compound limited according to the limitations recited in Claim 49, when utilized according to the presently claimed invention, produces a polymer having unexpected and non-obvious improvements over polymers produced by processes known in the art. As discussed above, Matsunaga fails to disclose Appellants' recited Group 15 catalyst compound. Nothing in Matsunaga nor Ewen disclose or suggests that this particular embodiment of the Group 15 catalyst compound will combine with a metallocene catalyst compound to produce a polymer having the novel and non-obvious benefits as disclosed in the instant application.

Thus, Matsunaga combined with Ewen fail to disclose or suggest a combination of the recited Group 15 catalyst compound with a metallocene catalyst of the presently claimed invention. As such, Ewen cannot be found to combine with Matsunaga to render the presently claimed invention obvious.

**H. CONCLUSION**

McConville in view of Ewen fails to render the instant claims obvious. Matsunaga in view of Ewen also fails to render the instant claims obvious. The cited prior art fails to disclose or suggest all of Appellants' recited limitations. Furthermore, none of the cited prior art, alone or in combination, contain any incentive or suggestion to motivate the skilled artisan to modify

the reference in such a way as to render the claims of the invention obvious. *In re Laskowski*, 871 F.2d 115, 117; 10 USPQ2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, “[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification”) (citation omitted); *In re Stencel*, 828 F.2d 751, 755; 4 USPQ2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established “by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made”). Accordingly, neither McConville in view of Ewen nor Matsunaga in view of Ewen provide a proper foundation for a rejection under 35 U.S.C. §103. As such, Appellants’ presently claimed invention is not rendered obvious over the cited prior art.

In view of the foregoing it is urged and respectfully requested that:

1. The Final Rejection of Claims 1, 7-10, 17, and 19-21 under 35 USC §103(a) as being rendered obvious over McConville view of Ewen be held in error and be REVERSED.
2. The Final Rejection of Claims 12 and 15 under 35 USC §103(a) as being rendered obvious over McConville view of Ewen be held in error and be REVERSED.
3. The Final Rejection of Claim 49 under 35 USC §103(a) as being rendered obvious over McConville view of Ewen be held in error and be REVERSED.
4. The Final Rejection of Claims 1, 7-10, 12, 15, 17, 19-21, and 49 under 35 USC §103(a) as being rendered obvious over Matsunaga in view of Ewen be held in error and be REVERSED.
5. The Final Rejection of Claims 12 and 15 under 35 USC §103(a) as being rendered obvious over Matsunaga in view of Ewen be held in error and be REVERSED.
6. The Final Rejection of Claim 49 under 35 USC §103(a) as being rendered obvious over Matsunaga in view of Ewen be held in error and be REVERSED.

Accordingly, the Appellant respectfully requests that the Board reverse the Examiner's rejections and allow Claims 1, 7-10, 12, 15, 17, 19-21, and 49 of the instant re-issue application to issue.

Respectfully submitted,

Date: August 27, 2009

/Jennifer A. Schmidt/  
Jennifer A. Schmidt  
*Attorney for Applicants*  
Registration No. 63,040

Univation Technologies, LLC  
5555 San Felipe, Suite 1950  
Houston, Texas 77056  
Phone: 713-892-3729  
Fax: 713-892-3687



### VIII. CLAIMS APPENDIX

The following listing of claims includes amendments previously presented, and are submitted as set forth in 37 CFR § 1.173(g) and MPEP § 1454 to be relative to U.S. Patent 6,274,684, and are not submitted relative to any prior amended version of the claims.

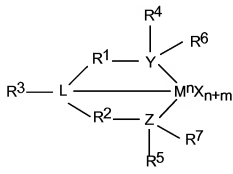
1. (Currently Amended) A process for polymerizing olefin(s) comprising, combining said olefin(s), a catalyst composition having a first catalyst [system] component comprising a Group 15 containing [bidentate or] tridentate ligated Group 3 to 7 metal compound wherein the Group 3 to 7 metal atom is bound to at least one leaving group and to [at least two] three Group 15 atoms, and wherein [at least one of the at least] two of the Group 15 atoms [is bound to a group 15 or 16 atom] are each bound to the third Group 15 atom through a bridging group; and a second catalyst [system] component,

wherein said second catalyst component is a metallocene compound;

wherein said first catalyst component and said second catalyst component are added to a polymerization reactor in one of a solution, a suspension or an emulsion;

wherein the polymerization process is a continuous gas or slurry phase process, and

wherein the Group 15 containing tridentate ligated hafnium catalyst compound is represented by the formula:



Formula (I)

wherein M is a Group 3 to 7 metal;

each X is independently a leaving group;

n is the oxidation state of M;

m is the formal charge of the Y, Z and L ligand;

L is a Group 15 element;

Y is a Group 15 element;

Z is a Group 15 element;

R<sup>1</sup> and R<sup>2</sup> are independently a linear, branched, or cyclic C<sub>2</sub> to C<sub>20</sub> alkylene group;

R<sup>3</sup> is a hydrocarbon group, hydrogen, a halogen, or a heteroatom containing group;

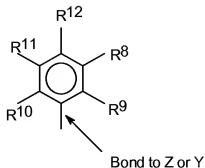
R<sup>4</sup> and R<sup>5</sup> are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or multiple ring system;

R<sup>1</sup> and R<sup>2</sup> may be interconnected to each other, and/or R<sup>4</sup> and R<sup>5</sup> may be interconnected to each other; and

R<sup>6</sup> and R<sup>7</sup> are independently absent, or hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group.

2 - 6. (Cancelled)

7. (Currently Amended) The process of [claim 6] Claim 1, wherein R<sup>4</sup> and R<sup>5</sup> are represented by the formula



wherein R<sup>8</sup> to R<sup>12</sup> are each independently hydrogen, a C<sub>1</sub> to C<sub>40</sub> alkyl group, a halide, a heteroatom, or a heteroatom containing group containing up to 40 carbon atoms, wherein

any two R groups may form a cyclic group and/or a heterocyclic group, and wherein the cyclic groups may be aromatic.

8. (Currently Amended) The process of claim 7 wherein  $[R^9, R^{10}, \text{ and } R^{12}]$   $R^8$  to  $R^{12}$  are independently a methyl, ethyl, propyl or butyl group.
9. (Currently Amended) The process of claim 8 wherein  $[R^9, R^{10}, \text{ and } R^{12}]$   $R^8$  to  $R^{12}$  are methyl groups[, and  $R^8$  and  $R^{11}$  are hydrogen].
10. (Currently Amended) The process of claim 9 wherein M is a Group 4 metal, L, Y, and Z are nitrogen,  $R^1$  and  $R^2$  are a  $C_2$  to  $C_6$  hydrocarbon radical,  $R^3$  is hydrogen, and  $R^6$  and  $R^7$  are absent.
11. (Cancelled)
12. (Currently Amended) The process of claim [2] 1 wherein the second catalyst [system] component comprises a [bulky ligand] metallocene compound of the general formula  $[L^D MQ_2(YZ)X_n]$



wherein M is a Group [3 to 16 metal] 4, 5 or 6 metal atom.

$[L^D$  is a bulky ligand that is bonded to M,]

$L^A$  and  $L^B$  are selected from the group consisting of cyclopentadienyl, tetrahydroindenyl, indenyl, fluorenyl, and substituted versions thereof.  $L^A$  and  $L^B$  are each bonded to M;

Q is a [univalent anionic ligand bonded to M] monoanionic leaving group.

$[Q_2(YZ)$  forms a unicharged polydentate ligand,]

$[X$  is a univalent anionic group or a divalent anionic group, and]

$[n$  is 1 or 2]

A is a divalent bridging group containing at least one Group 13 to Group 16 atom;

and

n is 0, 1 or 2.

13 - 14. (Cancelled)

15. (Currently Amended) The process of claim 12 wherein M is a Group 4 metal [and L<sup>D</sup> is an indenyl group or a fluorenyl group].

16. (Cancelled)

17. (Currently Amended) The process of claim 1 wherein the catalyst [systems comprise] composition further comprises an activator.

18. (Cancelled)

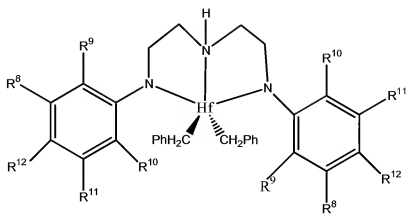
19. (Original) The process of claim 1 wherein the olefin(s) are ethylene and one or more other olefin(s).

20. (Currently Amended) The process of claim [2 wherein the Group 15 containing bidentate or tridentate ligated Group 3 to 7 metal compound and the bulky ligand metallocene compound] 1 wherein said first catalyst component and said second catalyst component are present in a molar ratio of 1:99 to 99:1.

21. (Currently Amended) The process of claim [2 wherein the Group 15 containing bidentate or tridentate ligated Group 3 to 7 metal compound and the bulky ligand metallocene compound] 1 wherein said first catalyst component and said second catalyst component are present in a molar ratio of 20:80 to 80:20.

22 - 48. (Cancelled)

49. (New) The process of Claim 1, wherein the Group 15 containing tridentate ligated Group 3 to 7 metal compound is represented by the formula:



wherein R<sup>8</sup> to R<sup>12</sup> are each independently a methyl, ethyl, propyl, or butyl group.

**IX. EVIDENCE APPENDIX**

No External Evidence is presented.

## **X. RELATED PROCEEDINGS APPENDIX**

There are no other appeals or interferences known to appellant, appellant's legal representatives, or assignee, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.